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4G Wireless Communication Networks: Design Planning and Applications

Editors:

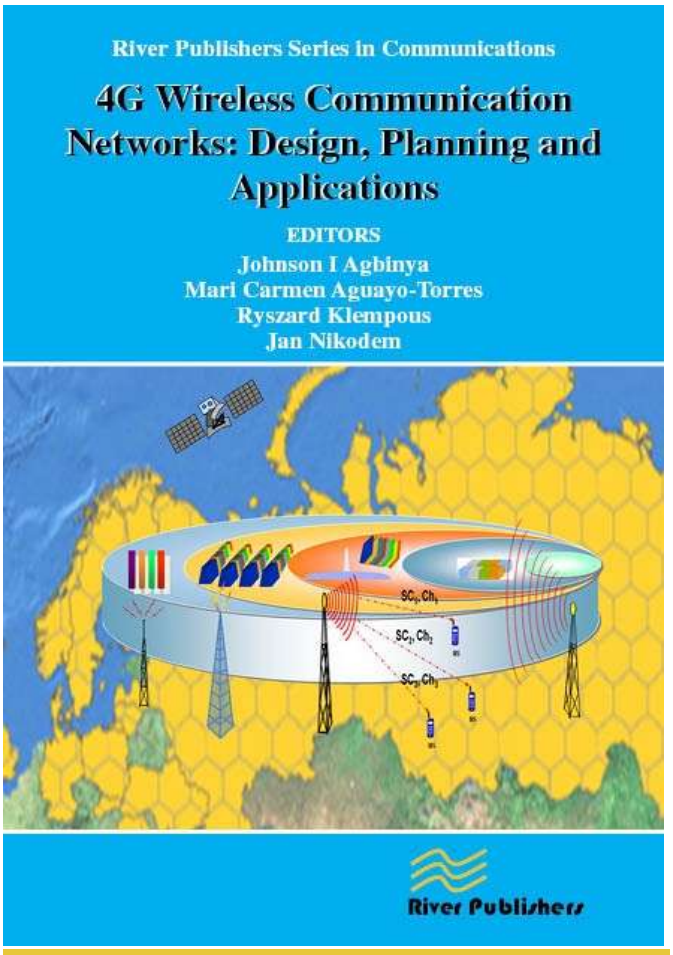
Johnson I Agbinya, Mari Carmen Aguayo-Torres, Ryszard Klempous and Jan Nikodem, La Trobe University, Melbourne, Australia,University of Malaga, Spain, Wroclaw University of Technology, Poland, Wroclaw University of Technology, Poland

The revolution in wireless communication technology was initiated in the nineties leading to the development of new mobile communication systems including GSM,, GPRS, EDGE, WCDMA, WLAN, HSDPA, WiMAX and recently LTE-Advanced. These technologies have revolutionized the way and manner modern communication is undertaken. The revolution is not only in network design but also in new devices, handsets and Internet enabled devices. It is impossible for these technologies to be created without the support of other fields such as advanced signal processing techniques including OFDM, MIMO, coding, voice, image and video compression. These developments have also created the migration in focus from fixed telephony to IP telephony with complimentary consequences in the use of social networking and online retail and sales. As welcome as the new developments are, the overwhelming depth of technical expertise required to understand and follow the progress in technology advancement makes it harder and harder for the telecommunication engineer to follow without a logical and detailed compendium of the major concepts leading to these advancements.

This book is a detailed compendium of these major advancements focusing exclusively on the emerging broadband wireless communication technologies which support broadband wireless data rate transmissions. S everal applications of the wireless communication networks including health care, underground communication, biomedical and bio-telemetry systems are detailed in the book.

Technical topics:

- Cellular communication concepts
- CDMA, WCDMA, WiMAX, LTE-Advanced and Zigbee
- Fading, diffraction and propagation models
- Block and error control coding in modern communication networks including msequences, OVSF, Gold and Golay codes
- OFDM and MIMO
- Multi-carrier and cooperative communication techniques
- Applications of wireless communication networks
- Optical networks
- Electromagnetic interference



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